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Reports of the
New Mexico School of Mines

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EXHIBIT "X."

REPORT

OF THE

SCHOOL OF MINES

For 1904.

REPORT

Hon. M. A. Otero, Governor of New Mexico, Santa Fe:

The past year has been most successful in the history of the School of Mines. The institution has rapidly expanded. Today it stands on a better foundation than ever before. Increased attendance in technical students has been marked and very gratifying. In percentage increase of new students the New Mexico School of Mines is believed to head the list of similar institutions of the country. It is believed that the total enrollment of new men will be fully half of that of the largest and oldest mining school. The prospects for the coming year are already very encouraging, for a greatly increased attendance.

A number of factors have conspired to make the real progress of the New Mexico School of Mines during the past year greatly exceed all anticipations. The work of instruction was thoroughly reorganized. In scholarship and practical experience the faculty was so strengthened as to make it second to none. A schedule of studies was arranged which not only greatly raised the standard of the school but placed it on the same level or above that of other and older schools of this country. Special emphasis was placed on the practical phases of mining and engineering, amongst which the school is so exceptionally favorably located. The result has been the New Mexico School of Mines has come to be recognized as having advanced to the front rank of similar institutions of the country.

POSITION OF THE MINING SCHOOL IN THE GENERAL EDUCATIONAL SYSTEM.

Every state institution whose field is higher technical and engineering training of youth has two very important duties to perform. On the one hand it has to provide proper facilities for serving the greatest number of citizens who wish to avail themselves of its special advantages. On the other hand the standard of instruction must be of such high grade that students graduated from it will be placed on a footing equal to that which other students enjoy who leave other similar schools and with whom its own men come in competition. If an educational institution fails in either of these obligations it becomes unworthy of its trust.

The New Mexico School of Mines is now believed to be fulfilling both of the conditions imposed upon it. But it has attempted to go further. The school has endeavored to prepare its men better along some special line than is commonly done so that when the graduate goes out into the active world of business he is more thoroughly trained and experienced than other men in some special field.

CLOSE ARTICULATION WITH THE PUBLIC SCHOOLS.

It is with satisfaction that it is announced that the adjustment of the School of Mines courses of study to those of the High Schools of New Mexico and of the grade schools continues even closer than ever before. Through the Socorro City Schools the articulation is complete. There is now no break from the lowest to the highest work.

The plan has been mutually highly beneficial. In the first place it has resulted in a marked upbuilding of the city schools. Another year will see the transformation complete. Secondly, a burdensome and unjust expense to the higher state institution has been relieved. Thirdly, it is believed that the plan is applicable to every higher institution of learning in New Mexico with vast benefits to the institutions themselves and great relief to the state treasury

Thus, the Mining School occupies a field that is distinctly its own. It does not trespass the ground that is properly the province of the University, as the head of the public school system and as a place peculiarly fitted for the pursuit of cultural studies, and for the training of teachers. It in no way conflicts with the field of the Agriculture College, as the fountain head of intelligent farming, manual training and mechanical work. It no where touches the Normal Schools, the special purpose of which is to fit teachers for our public schools. Even if it were so desired the School of Mines could no more organize departments that properly belong to the other state institutions without violating its primal duty to its student body, and without abrogating its trust to the people, than they could attempt to duplicate the work of this school.

A WORKING MINE FOR PRACTICAL TRAINING.

One of the unique features of the New Mexico School of Mines is a working mine for actual practice for students. No other institution in the country possesses such facilities for practical training. The school has been exceedingly fortunate in making this valuable acquisition. Moreover the mine is in sight of the campus and readily accessible by a half hour's walk.

It is of interest to know that this departure has already received world-wide notice among mining men. Under the heading of "An American Idea" the leading mining journals of Australia recently made the following editorial statement:

The growth of the idea that graduated students in mining engineering should have some practical experience before being permitted to supervise mining work has been variously met by the mining schools.

It has been the custom of some of the mining schools of the Atlantic states to send the students of the graduating class in the summer vacation, under the charge of the instructor, on an excursion through prominent mining districts. The main object of such a tour being, of course, to give the students some practical insight into mining operations, and to bring them into contact with their future work.

The mining schools of the Rocky Mountain states are situated in a natural environment of mines and ore treating plants in great variety. They are enveloped in a mining atmosphere, as it were. The students are in constant contact with mining men and mining operations of all kinds. The information which the student thus absorbs, most of it unconsciously or at least without effort, is worth as much as the theoretical and laboratory work he does. But even then the students do not have facilities that will enable them to enter into the actual work of mining and to acquire a certain practical familiarity with the working details which is so essential to successful operations. In order to overcome this lack of detailed practical knowledge many students spend their summers in manual work in the mines. This in a measure, is commendatory, but it does not fulfill the needs of the case. Something better is required. The New Mexico School of Mines has endeavored to furnish adequate facilities of the kind referred to by acquiring an important mining property of its own where instruction in practical mining may be given after its own ideas. This property is the Torrance gold and silver mine near Socorro, a mine which has already made a good record and still has a long way to go to complete that record.

The first attempt ever made to establish a practical mining laboratory in any educational institution by incorporating an actual working mine is believed to be that begun in the summer of 1902 by the New Mexico School of Mines. At that time the possibilities were first considered for the use of the Rio Grande smelting works at Socorro as a laboratory of practical metallurgy. As a companion experiment in mining education a laboratory for practical mining was considered. Much time was spent in trying to find suitable property from which a model mine could be developed. After thorough examination a small but promising property was finally acquired and plans were made for developing it. Soon afterwards a larger and more attractive mine was found to be on the market, and only a short distance from the college campus. Mainly through the generosity of one of Socorro's prominent citizens this property, the Torrance mine, with all its appointments, has come into the absolute possession of the school. Included in the transaction is a bond and lease for a period of years on five adjoining properties

The Torrance gold and silver mine has long been known as one of the most famous in the Southwest. It has a remarkable record. Already it has produced nearly $1,000,000. This mine presents one of the finest examples of timbering in New Mexico; the main opening is through a double compartment incline; there are five levels. Important ore-bodies are opened up. Great variety in mining methods is shown. There are fine stopes, and on the fifth level there is a shaft. The geological structures associated with ore deposits are seldom so well displayed. The problems presented are many.

Variations innumerable are found in contiguous properties. The hoisting house is substantially constructed, and the orebins are capacious and well built.

Exceptional opportunities are thus offered for students to carry on actual mining opperations. Sinking of shafts, driving levels, constructing winzes, advancing development work, and stoping are included. Timbering in its various phases is undertaken. Complete surveys are made and maps drawn. The mine is thoroughly sampled and the samples assayed. The geological conditions are carefully studied both underground and on the surface. There is practice in reporting on mining properties and the valuation of the ore-bodies. Plans and specifications are drawn up for all appurtenances connected with the operation of the mine under varied conditions and in relation with the milling. All other work of an engineering character receives attention.

SCHOOL OF MINES EXHIBIT AT WORLD'S FAIR.

At the Louisiana Purchase Exposition held at St. Louis during the past year the New Mexico School of Mines made a display that was somewhat out of the regular order of educational exhibits, and won for New Mexico the gold medal for minerals. The display consisted of five principal collections.

(1) Suites of zinc carbonate ores of great beauty and variety; (2) cases of rare zinc minerals which were the finest ever shown; (3) collection showing great variety of zinc minerals from a single locality; (4) minerals and ores from a single locality, forming a complete smelting proposition; and (5) collection of remarkable replacement ores of zinc.

These exhibits filled fifteen large glass cases, and two large pyramids. A special collection illustrating the mineral resources was prepared but was not all sent on account of the commissioners giving up the space allotted to the school in the mines and metallurgy building. This exhibit consisted of a large relief map of New Mexico, 16 by 18 feet, on which the mining districts were represented. Samples of all mineral substances found within the boundaries of New Mexico were intended to furnish hand specimens for inspection, and a thousand photographs, illustrated developments and improvements. A large colored section of the geological formations in accordance with the latest obtainable data was an important feature.

STUDENT LOAN FUNDS.

Several loan funds have been established for the purpose of aiding worthy students who might without such assistance be unable to complete their courses in this institution. The conditions governing the distribution of the different loan funds are essentially the same in their main features, though differing somewhat in details.

Assistance thus offered is placed upon a strictly business basis, without a thought of charity. Attached is no suggestion of a gift outright. Opportunity is presented the student to pay his own way depending upon no one but himself. Moreover it is assistance given at a time when the student most requires it.

The loans are made for three, four or five years, and bear six per cent interest. The accruing interest is added to the loan fund when the amount of the loan matures. Thus the interest as it accumulates goes toward enlarging the fund which will from time to time also receive additions from other sources. With this gradual expansion of the loan fund its usefulness will be greatly broadened.

An important condition governing the loans is the previous record of the student as to his character and his work

BYERTS, LOAN FUND.

This fund has been established by Mr. William H. Byerts, of Socorro, and important augmentations are promised soon.

The individual loans are of $50 and $100. In distributing the funds preference is given those students who have most nearly completed their courses. The loans are made upon the recommendation of the faculty by the board of managers, each note bearing six per cent interest in from three to four years.

Preliminary to receiving a loan the student shall file recommendation from at least two responsible persons in no way connected with the school. In all cases preference will be given those students nearest graduation. A very essential condition of the allotment is the previous good record of the student.

All accruing interest goes into the general loan fund for the benefit of other needy students.

NEW MEXICAN LOAN FUND.

As a further aid to needy students of New Mexico twenty-four special loans are each year provided. The amounts of these loans vary somewhat, but each covers the amount of all tuition and laboratory fees for the year.

A loan from this fund is available for one student from each county in New Mexico, and is allotted on the same conditions as other aid from the general loan fund.

ALLIS-CHALMERS SCHOLARSHIPS.

Application of the work of the New Mexico School of Mines has received recognition by the largest manufactures of mining machinery in the world. Only one other institution in the United States has been thus favored.

To one member of each years' graduating class there is offered by the Allis-Chalmers company, manufacturers of mining and heavy machinery, with large works at Chicago, Milwaukee, and Scranton, an opportunity of four months' study and employment in any of its plants, and an emolument of $150.00.

This scholarship is awarded by the Board of Trustees on the recommendation of the faculty from those graduates of the year filing applications before the 10th of June. This opportunity is exceptional to observe and study the building of all kinds of modern mining and metallurgical constructions.

COMMERCIAL ASSAYING AND TESTING WORKS.

Plans have finally been completed whereby practice in actual commercial work of a metallurgical character may be acquired by students. The wide demand which exists in the great mining district of the southwest for disinterested and scientific tests and practical investigations has led to the establishment, by the New Mexico School of Mines, of a bureau for conducting all kinds of commercial work relating to mining and metallurgy. For this service the exceptional facilities of the various laboratories of the school and the extensive and practical experience of the instructors are freely offered. A reasonable charge is made for all assays, chemical analyses and other tests. While the pecuniary considerations cannot be entirely overlooked, great stress is placed upon excellence of work and exactness of results.

The expert character of instructors guarantees accuracy of the tests placed in their charge, and the special equipment of the school is such that few private assay offices and ore-treating plants can accomplish satisfactorily the work even if undertaken. The rapidly increasing amount of this work intrusted to the school is sufficient evidence in itself that the plan has been long needed to further development of the mineral resources of the region.

The value of work is fully appreciated by successful mine owners and engineers in charge of properties. Probably no feature of the mining industry is more important than the avoidance of costly mistakes. There is nothing which more quickly brings a mining camp into bad repute than idle plants and deserted mines. Prospective investors wish first of all to be shown activity. In most cases of dead camps the idleness is not so much the fault of the district as it is the lack of recognition of the proper and most economical treatment of the ores.

A special act of the legislature makes provision for carrying on commercial testing. The section from the law governing the School of Mines, Chapter 138, Section 38, Acts of 1889, reads: "The board of trustees shall require such compensation for all assays, analyses, mill-tests, or other services performed by said institution as it may deem reasonable and same shall be collected and paid into the treasury of the School of Mines." All moneys received from this source are used for the betterment of the laboratories.

A special circular is issued giving the schedule of charges, other necessary information and method of preparing and shipping samples. Copies are mailed on application. By special resolution it is required that all charges shall be paid in advance.

COMMERCIAL ASSAYING.

The assaying for gold, silver, copper, lead, zinc and the common metals is carried on in all its various phases. The charges are about the same as everywhere prevalent. All work is run in duplicate and in case of any nonconcordant results such assay is repeated. On charges on assays for mining companies amounting to $50.00 a month a special discount is given. Particular attention is given to umpire work.

Assays for the rarer metals, as uranium, venadium, nickel, and the like are made under specially favorable conditions which insure great accuracy. Lime, silica, iron, alumina and manganese determinations are made according to improved methods and at rates considerably below the customary charges.

EXPERIMENTAL TESTS ON ORE TREATMENT.

Accurate laboratory tests are carried on in order to determine the most approved method of treating complex and difficult ores. The scope of this work is continually enlarging. As soon as the Rio Grande Smelting Works comes into full operation it is expected that eventually every known method and every kind of machine will be in readiness to run practical working tests up to mill-runs of 100 tons This work is done under expert supervision, with no predelection to method of machine. In this way unbiased results are obtained and the latest and most economical way of treating each kind of ore secured. If they so desire miners or operators may accompany samples and observe the various processes involved, thus familiarizing themselves with all details and availing themselves of the knowledge of skilled manipulators of ore-dressing machinery.

CYANIDE PROCESS.

There has been recently erected by the School of Mines a complete experimental plant after special and improved designs. Practical working tests in large or small quantities of ores and tailings by the cyanide process may be made. This plant is very compactly and conveniently arranged and will treat lots up to five tons. A large plant of similar character is also planned for more extensive work.

All known processes of leaching are also amply prepared for, including especially Clorination and the Theosulphate methods. Quantities of ores or tailings up to one ton are treated.

METALLURGICAL METHODS.

Full facilities are provided for laboratory experimentation of the proper metallurgical treatment of specific ores Plans are nearly completed for making tests of this kind on a commercial scale.

FREE DETERMINATION OF MINERALS.

It has been the custom of the school to gratuitously make determinations of the nature of all minerals and rare ores from New Mexico, provided that a complete chemical analysis or assay is not required. Similar substances from other states will be determined in the same way when not interfering with the regular work of the laboratories. Tests for the common metal must of course be regarded as assays and as coming under the rules governing such.

The name of the locality where the mineral was found and of the mining claim should be given in order that it may be made a matter of record for enabling the value and distribution of the mineral wealth of the southwest to be better understood.

WATER ANALYSIS.

The chemical analysis of waters for city water supplies, boilers, and domestic use and of mineral and mine-waters has of late assumed great importance. The chemical laboratories of the school are fully equipped and in the case of bad waters suggest remedies and methods to be used to improve the waters for specific purposes. A large number of analyses of waters from the southwest have already been made, and very interesting results obtained. Eventually it is expected to incorporate the results of some of these investigations in a comprehensive report on the Mineral Waters of New Mexico.

FUEL ANALYSIS.

Another branch of work which has been constantly receiving more attention has been an inquiry into the fuel values of the coals of the regions. Complete analyses and heat tests have been made of some of the principal deposits. With the work already done the results of new analyses are made of special value on account of the comparative figures that can be supplied.

MANUFACTURING CHEMICAL TESTS.

In the mining regions of the Rocky Mountains occur, besides the metalliferous deposits a large number of other substances which may be mined for their commercial values. The laboratories of the school are fully equipped to make determinative test on the uses, methods of treatment and values of these minerals.

FACILITIES FOR METALLURGICAL PRACTICE.

Socorro appears to be exceptionally fortunate in location for the mining school. A feature which must appeal strongly to all interested in practical training in mining and metallurgical work is a complete smelting plant. While the smelter will not be run as a commercial reduction works, much of the plant can be altered so as to form metallurgical laboratories such as no other school in the country possesses.

For more than a decade the Rio Grande Smelting works at Socorro was one of the most important plants in southwestern United States Recently the management found it adviseable to concentrate its work somewhat. In consequence the Rio Grande plant became inactive as a commercial property. Through the generosity of the secretary of the Company, Mr. H. M. McChesney, the New Mexico School of Mines has been able to practically close negotiations whereby it now comes into possession of this property for its Metallurgical Department, and for the Mechanical and Electrical Engineering work.

The property is located a short distance from the campus of the School. It consists of 280 acres of land, on which are located upwards of 20 substantial buildings, large and small.

An abundant and very pure water supply is obtained from the springs in the Socorro Mountains, and is piped to all parts of the grounds. A switch, with six spurs from the Atchison, Topeka and Santa Fe main line, reaches all the principal buildings.

With some alterations, the entire plant will be more especially adapted to the uses of the School. It is believed that already, the School has the most extensive and best equipped laboratory of practical metallurgy in the country. With complete sampling-works, stamp-mills, roasting-furnaces and blast-furnaces, the intention is to carry on every method of treatment of ores, on a scale not usually undertaken. Tests may be made on ores in quantities varying from a few pounds up to ton-lots, car-lots, or even runs, of 100 tons.

Besides the original metallurgical experience demanded of engineering students, practical experimentation in ore treatment is made a prominent feature of the work. Complex ores which do not separate cleanly and satisfactorily, or which do not reduce readily, or which do not save sufficiently high percentages may be run through different machines until the required work is properly done. For these tests the operators may accompany the samples, or ship them in and have the work done under experienced direction. Practical and systematic experimentation constantly goes on with the view of improvement of methods, devices and machinery. Particular attention is to be given to magnetic separations. In fine, the whole arrangement is that of a thoroughly practical and professional metallurgical laboratory on a large scale.

PERMANENT DISPLAY OF MINERAL RESOURCES.

There has been formulated a rather comprehensive plan for a complete museum of the New Mexico mining industry and mineral resources. The best part of the fine mineral display of New Mexico at the Louisiana Purchase Exposition returns to the School of Mines. This forms an important addition to the material already accumulated. When full provision shall have been made for its proper display it is expected that this museum will form one of the most attractive features in New Mexico.

The collections will aim to illustrate as fully as possible the following departments: Ores and ore-genesis, constructional materials, rocks and minerals, geological structures, models of mines, mining engineering constructions, materials illustrating the history of mining, metallurgical products, the mineral resources of New Mexico, and the Southwestern United States, and models of mining machinery. Accompanying these exhibits will be a full series of maps, charts, plans and photographs as further illustrations.

Temporarily the collections of ore, rocks, minerals and other illustrative material are housed in the east wing of the Chemical Building. The scheme is to exhibit as completely as possible:

(1) Mineral resoures of New Mexico.
(2) Natural resources of Southwestern United States.
(3) Typical mineral deposits of North America.
(4) Selected mineral examples from the classic localities of the world.

The collections are divided into (a) an exhibition series, which is arranged in glass display cases, and (b) study series which are placed chiefly in tiers of shallow trays. Of neccessity by far the greater portions of the specimens are not for public display.

In addition, the collections of the president will be soon accessible to the advanced student. These consist of a small but carefully selected series of crystals, collections of crystalline rocks, chiefly from type-localities of Europe and this country, and working suites of fossils, illustrating structures and the types of life from all the various geological formations, both American and European, these being especially rich in crinoids, which number upwards, of 2,500 specimens.

INSTRUCTION DURING SUMMER.

An innovation among educational institutions is a regular term of practical mining work at the school during the summer. There has long existed a need for some such arrangement. This demand has been variously met by the mining schools of the country. In attempting to satisfy this rapidly growing demand several institutions have planned for trips of some weeks' duration through active mining camps. A still further step in the proper direction is the establishment of a summer camp where practical work can be carried on for several weeks, as was done last year in Colorado. But the School of Mines is the first mining school to arrange for a regular half year's work during what is generally considered the "long vacation."

A "Summer School" in the ordinary meaning of this term, is not held at the School of Mines. As may be noted by reference to the calendar, the academic year is divided into two semesters of seventeen weeks each. The summer term of sixteen weeks counts as a full half year. While no long lecture courses may be given during this session, the work of the school goes on under the direction of a committee of the Faculty.

For the summer term is reserved all such work as demands much time, uninterrupted by diversions. Among the courses that are best carried on at this time are ore dressing, various metallurgical processes, assaying, railroad, land and mine surveying, mine inspection, certain phases of design, engineering experimentation, geological field-work, and thesis work. Certain courses in draughting, certain laboratory work, and mapping may also be advantageously engaged in.

Not all of the work of the character mentioned need be done under the direct supervision of the instructor in charge. Nor is it necessary that some of the more advanced phases of it be done altogether in this institution. Work may be done outside with the advice of the professor under whom the course is usually conducted, and he need be consulted only so often as he may think advisable. These are cases in which the student attaches himself to some regular railroad corps, to some reducing works, or to the field party of a topographical, hydrographic of geological survey, when such work comes directly in line with his regular work.

In surveying and engineering, advanced men have in the past found ready employment in various capacities, not only getting a good drill in actual practice but good pay for their services. Demands for capable men for each season usually exceed the supply. There is every reason to believe that in the future the call for properly trained men will increase rather than diminish.

While in the metallurgical work no positions in the various smelting works have been opened in the past it is expected that ample provision will be made hereafter for willing students, whereby they may obtain a varied experience and at the same time receive adequate compensation for their efforts.

The outlook for the coming season is that a limited number of men may be taken on the geological or topographical surveys.

Faithful accomplishment of field duty during the summer term enables a student to add a half year's work to his credit in the regular courses of the school.

In pursuing the regular professional summer work in the field, whether for surveying, mining, or geological mapping, a camp is established at some convenient place and the work carried on systematically day after day, in regular fashion, until satisfactorily completed, when the camp is moved to another advantageous locality. The different camps may be adjacent or far removed from one another. Moreover, the kinds of effort expended at the various camps may be wholly different. One of the main objects is to give the student as broad and as varied an experience as possible. By these courses, the student is given far greater opportunities for extended and continuous field practice than he is possibly able to have during the other portions of the year. The expense attached to the work of the summer term is usually no greater than for either the first or second semesters.

In a similar manner the professional work in the summer term is conducted in mining and metallurgy. A party of students and their instructors organize itself and lays out the plans for visiting the various mining camps, mills, reducing works, and other localities of special geologic interest. After the party establishes itself in a particular district, systematic studies of all the details connected with mining methods, the manner of laying out mines, the underground surveys, and the treatment of the ores are taken up in turn, before passing on to another district. The same general scheme of practical instruction is followed in the case of the sojourns at smelting works, and in the field especially visited for the geological features presented.

Special stress is laid upon the proper keeping of notes. These are fully written up each day. They are made use of later as a basis of other work in connection with the regular courses. Besides, if carefully kept, they prove valuable references in later years.

It may be, and in all likelihood will often happen, that the summer field parties in mining, metallurgy and geology will not be kept intact as a single organization, but that there will be formed three entirely distinct groups, each having widely different fields of action.

The details of the summer work are given in special bulletins several weeks before the close of the second semester.

THE MINING LIBRARY.

During the past year numerous valuable additions have been made to the library. Some important books have been acquired through purchase. Several hundred volumes have been acquired through donations of institutions and individuals. Through the efforts of one friend of the institution living in the east, there has recently been given to the School a large collection of valuable books numbering over 1,000 volumes, most of them substantially bound in leather.

The libraries of the New Mexico School of Mines consist of a general library and department libraries.

In the main library are the works of reference, the encyclopedias, dictionaries, journals, magazines, proceedings of the learned societies, laboratory publications, periodical issues of other colleges, reports of Federal, State and Foreign surveys, official maps, plats and atlases, a complete set of the publications of the School, and volumes on history, travel and philosophy.

Libraries are located in the several departments of the School. These are essentially working libraries. They consist of carefully chosen treatises, text-books, monographs, special contributions, and author's separates, pertaining to the respective divisions. Each department is under the direct supervision of the professor in charge, and is open under certain regulations at all reasonable times.

The general library is in charge of a librarian who also supervises the purchase of books, the cataloging of all the books, the issuing of those works not withheld from general circulation, directs the distribution of the School publications, and arranges for the exchanges. The librarian also is in charge of the general reading-room, where the current periodical literature is to be found upon convenient tables.

The libraries are growing rapidly. During the past year many valuable additions have been made, including some complete sets of publications of technical institutions. Additional bookcases have been installed. An entire re-arrangement of the books is going on. An elaborate and elastic scheme of cataloging on the card system has been devised, so that the libraries will be thoroughly adopted not only for reference but as working libraries.

Every effort is being made to make the files of the various technical journals, the transaction of engineering societies and the scientific periodicals as full as possible. Contributions of early volumes and numbers especially are earnestly asked. Due credit will be given donors.

The private libraries of the professors are available to advanced students. So soon as suitable arrangements can be made and proper space allotted to it, it is expected that the President's private library, consisting of upwards of 2,000 bound volumes, and upwards of 3,000 pamphlets and author's reprints, chiefly on the subjects of mining, geology and mineralogy, will be made accessible to students engaged in advnced work and original investigation.

RECENT PUBLICATIONS.

Besides the Annual Register and the Report of the President the School had issued three of its series known as "Circulars of Information" The first of the Roports of the Geological Survey is now in press. It treats of the "Geology and Underground Water Constitutions of the Jornada del Muerto" in south-central New Mexico. Second report of similar character is now nearly ready for the printer.

It is a generally acknowleged fact among the higher educational institutions that an instructor cannot be considered a modern educator unless he at the same time is something of an investigator. Of special interest is it to learn that members of the faculty of the School of Mines have not been idle in this respect during the past year. Some of their publications have been received favorably throughout the mining world. Most of their writings have dealt with the mineral resources of New Mexico. Their wide range of interest may be judged from the perusal of the subjoined list of some of the more important titles.

1. Geological Structure of New Mexican Bolson Plains (Am. Jour. Sci., (4), Vol. PV, pp. 207-210, New Haven, 1903).
2. Notes on Mining in New Mexico. (Engineering and Mining Jour., Vol. LXXV, p. 98, p. 132, p. 164, p. 498-499).

3. New Mexico Mines in 1902. (Engineering and Mining Jour., Vol. LXXV, p. 117, New York, 1903.)

4. Comparative Values of Different Methods of Geologic Correlation. (Proc. Iowa Acad. Sci., Vol. X, pp. 105-107, Des Moins, 1903).

5. Significance of the Occurrence of Minute Quantities of Metalliferous Mineral in Rocks. (Proc. Iowa Acad. Sci., Vol. X, pp. 99-103, Des Moines, 1903).

6. Genesis of Certain Cherts. (Proc. Iowa Acad. Sci, Vol. X, pp. 103-107, Des Moines, 1903).

7. Geologist in Practical Mining. (Engineering and Mining Journal, Vol. LXXV, pp. 925-926, New York, 1903).

8. Geological Sketch of New Mexico. (Ores and Metals, Vol. XII, p. 48, Denver, 1903).

9. Some Recent Aspects of the Permian Question in America. (American Geologist, Vol. XXXII, pp. 218-223, Minneapolis, 1903).

10. Ephemeral Lakes in Arid Regions. (Am. Jour. Sci. (4), Vol. XVI, pp. 377-378, New Haven, 1903).

11. Remarkable Silver Pipe. (Eng. and Mining Jour., Vol. LXXVI, p. 805, New York, 1903).

12. Geology of the Apache Canyon Placers. (Eng. and Mining Jour., Vol. LXXVI, pp. 966-967, New York, 1903.)

13. Block Mountins in New Mexico. (American Geologist, Vol. XXXIII, pp. 19-23, Minneapolis, 1904).

14. Review of Current Geological Literature. (Several Reviews in the American Gelogist and other journals of the year 1904).

15. Geological formations in New Mexico. (Report of Governor of New Mexico to Secretary of Interior, for 1903, pp. 337-341, Washington, 1904.)

16. Remarkable Occurrence of Aurichalcite. (Proc. Iowa Acad. Sci., Vol. XI, p. 253, Des Moines, 1904).

17. Certain Basin Features of the High Plateau Region of Southwestern United States. (Proc. Iowa Acad. Sci., Vol. XI, pp. 254-257, Des Moines, 1904).

18. Note on Carboniferous Faunas of the Mississippi Valley in the Rocky Mountain Region. (Proc. Iowa Acad. Sci., Vol. XI, pp. 258-9, Des Moines, 1904).

19. Bolson Plains and the Conditions of their Existence. (American Geologist, Vol. XXXIV. pp. 160-164, 1904).

20. Marked Unconformity of the Cretaceous upon the older Rocks of Central New Mexico. (Am. Jour. Sci., (4), Vol. XVII, pp. 356-358, New Haven, 1904).

21. Iron Deposits of the Chupadera Mesa. (Eng. and Mining Jour., Vol. LXXVIII, p. 632, New York, 1904).

22. Hagan Coal Field. (Eng. and Mining Jour. Vol. LXVIII, pp. 670-671, New York, 1904).

23. Laws of New Mexico Mountain Ranges. (American Geologist, Vol. XXXIV, 1903).

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URGENT NEEDS OF THE SCHOOL.

The most necessary things that the School of Mines stands in great need of at the present time are additional accommodations and apparatus. Of the first mentioned it seems imperative that adequate provision should be made at the earliest possible moment for a dormitory for the accommodation of the younger class of students from New Mexico. Additional lecture rooms, laboratory rooms and drawing room are very essential if the work of the institution is to go on without being greatly hampered, in order to properly display the rapidly growing collections illustrating the mineral and mining resources of New Mexico. An adequate building that would temporarily relieve the most pressing need in this direction could be provided for without large outlay.

Respectfully submitted,

CHARLES R. KEYES, President.